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On the selection of arbitrators

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On the Selection of Arbitrators

(Supplemental Appendix)

Geoffroy de Clippel, Kfir Eliaz, and Brian Knight

July 5, 2012

1 Agencies and the Procedure They Follow

Procedure	Agency	Link	Section
Rank-Veto	FMCS AAA AIRROC CBAAS Hong Kong Construction Association State of New Hampshire	http://www.fmcs.gov/internet_text_only/itemDetail.asp?categoryID=197&itemID=16959 http://www.adr.org/sp.asp?id=22440#R11 http://www.airroc.org/drp/default.aspx?file=THE_AIRROC_DISPUTE_RESOLUTION_PROCEDURE.pdf https://www.cincybar.org/arbitration_Rules.asp http://www.hkca.com.hk/upload/files/0100015727.pdf http://www.nh.gov/beltr/forms/documents/arbitration.pdf	1404.12 (c) R-11 (b) 3 VI. Appendix 3: 2.7 4
Alternate Strike	FMCS California Code of Civil Procedure Virginia Acts of Assembly SEC Union Oregon Revised Statutes ARIAS U.S. Montana Code City of Sacramento Charter SUNY Brockport City of San Luis Obispo Airline Labor Dispute Resolution Act Ventura County Community College CUE Union University of Michigan State of Wisconsin City of Colorado Springs Cecil County	http://www.fmcs.gov/internet_text_only/itemDetail.asp?categoryID=197&itemID=16959 http://law.justia.com/codes/california/2009/ccp/1299-1299.9.html http://leg1.state.va.us/cgi-bin/legp504.exe?051+full+CHAP0356+pdf http://www.secunion.org/CBAArticle33 http://www.leg.state.or.us/03reg/measures/sb0400.dir/sb0444.a.html http://www.arias-us.org/index.cfm?a=91 http://data.opi.mt.gov/bills/mca/20/4/20-4-204.htm http://www.qcode.us/codes/sacramento/view.php?topic=city_of_sacramento_charter-xix-603&frames-on http://www.brockport.edu/policies/docs/attendance_policy_appeal_process.pdf http://www.slcity.org/cityclerk/elections/2011/Measure%20B/2000Election/Full%20Text%20-Meas%20S.pdf http://railwaylaboract.com/altra-s.1327.htm http://www.vccod.edu/assets/pdf/human_resources/atf_16.pdf http://www.cueunion.org/bargaining/contract/art03.php http://www.vpcomm.umich.edu/gsi-sa/contract05-08-a16.html http://legis.wisconsin.gov/2009/data/AB-450.pdf http://www.springsgov.com/units/municipalcourt/lajurors.htm http://www.ccgov.org/commissioners/ordnance/2011.04.sheriffsofficeamendment.pdf	1404.12 (c) 1299.4, (c) 1. B. 33: 2 A 243.746 4 5 B) II. A. (d) (2) 2. (2) 16.12 V. B. C. 2. G. 4. c. Page 3, Lines 12-16 5

2 Empirical Test of Strategic Play

Our test of strategic play exploits the panel aspect of the data from the New Jersey Public Employment Relations Commission (PERC), as described in Section 2, and involves an analysis of pairwise reversals in rankings. If an employer, for example, ranks arbitrator a over b in one case but arbitrator b over a in another case, we infer that, under an assumption of stable preferences, these rankings do not reflect the preferences of the employer and hence that the employer was strategic.

As should be clear, this test requires an assumption of complete information, as maintained above, and an additional assumption of stable employer preferences for a given employer across cases. Under this assumption, if the same pair of arbitrators appears in two different cases, then one should always be ranked above the other by non-strategic players with the same preferences. Pairwise reversals in rankings would thus provide evidence of strategic behavior.

This test is aided by the fact that the same arbitrators appear repeatedly in the data. Given that employers occur in multiple cases more commonly than do unions, we focus our analysis on comparing employer rankings of arbitrator pairs across multiple cases. Based upon these repeated occurrences of arbitrators and employers, we found 447 observations in which an employer had the same two arbitrators in the choice set in two different arbitration cases and in which the two sets of rankings can be compared.¹

One reason that the assumption of stable preferences might be violated involves learning by employers about the desirability of different arbitrators. We address this issue by excluding observations in which one of the arbitrators was assigned to the employer in the period between the two cases. In these situations, it is reasonable to assume that the employer learns something, such as the tendency of this arbitrator to side with the employer, from this experience. Such learning could potentially change the employer's preferences over arbitrators in the context of future cases. Of the original sample of 447 observations, we find that one of the arbitrators was assigned to the employer in 198 observations in the period between the two cases.² Excluding these 198 observations, we have 249 observations in which the employer had no interaction with the two arbitrators during the period between the two cases.

¹If both arbitrators are vetoed in one (or both) of the two cases, we cannot determine the relative ranking of these two options in that case, and these observations thus excluded from the analysis.

²This could be due to the arbitrator being selected in the first of the two cases or in a separate case during the intervening time period.

In these cases, we do not expect employers to learn something about the arbitrator, and we thus assume that employer preferences over arbitrators are stable in these cases.

	consistent	reversal
no experience	66.27%	33.73%
experience	56.06%	43.94%

Pairwise reversal of employer rankings by experience with arbitrator

As shown, of these 249 observations, the relative rankings of the two arbitrators switches in around one-third (34 percent) of the observations. The relative rankings of the two arbitrators is unchanged/consistent in the other two-thirds (66 percent) of the observations. This finding of a substantial number of reversals is inconsistent with sincere rankings under the assumption of stable preferences and suggests that there is some element of strategic play involved in these rankings.

As noted above, this analysis excludes the observations in which the employer had some experience with the arbitrator during the period between the two cases. For comparison purposes, we next present results for this set of observations. As shown, among the 198 observations with interactions during the time period between the two cases, we see a somewhat higher switching rate (44 percent versus 34 percent), and this difference of 10 percentage points between these two types of cases is statistically significant at the 95-percent level. This finding of a higher switching rate when the employer had an interaction with the arbitrator is consistent with employers learning from working with specific arbitrators.

As noted above, this test of pairwise reversals requires an assumption of stable preferences in the two cases. To shed light on the validity of this assumption, we next use information on the time that elapsed between the two cases. It is reasonable to assume that if preferences are not stable, then more switching in rankings should occur as the time that elapsed between the two cases increases.

years between cases	consistent	reversal
0	83.02%	16.98%
1	67.57%	32.43%
2	64.44%	35.56%
3	57.69%	42.31%
4	60.61%	39.39%
5	62.50%	37.50%
6	61.54%	38.46%
7	60.00%	40.00%

Pairwise reversal of employer rankings by experience with arbitrator

As shown and focusing on the subset of cases in which the employer had no interaction with either of the two arbitrators under consideration in the period between the two cases, switching rates are increasing as the number of years between the two cases increases. In particular, if the cases occur during the same year, then reversals occur in around 17 percent of cases. This rate increases to 32 percent if there is one year between the two cases and to 36 percent if there are two years between the two cases. Beyond two years, the reversal rates stabilize at around 40 percent.³

This finding of an increase in reversal rates as the elapsed time increases suggests that the assumption of stable preferences is questionable. On the other hand, there are still a sizeable fraction of switches, 17 percent, when the two cases occur during the same year. It seems unlikely that preferences would change during the same year, especially given that the employer has no interaction with the arbitrators in these cases. Thus, while we find some evidence that preferences are not stable, we continue to see instances of switching in cases where the assumption of stability is most plausible. Thus, any possible instability in preferences cannot entirely explain the finding of a substantial number of switches.

3 SPE Paths for AS and VAOV

3.1 Alternate Strike

Preference Profile 1

Player 1	Player 2
<i>a</i>	<i>e</i>
<i>b</i>	<i>d</i>
<i>c</i>	<i>c</i>
<i>d</i>	<i>b</i>
<i>e</i>	<i>a</i>

³While there could be up to 11 years between the two cases, the number of observations is too small to conduct a meaningful analysis when the number of years between the two cases exceeds seven.

Subgame-perfect equilibrium paths:

Player	Action	Player	Action
1	$x \in \{d, e\}$	2	$y \in \{a, b\}$
2	$y \in \{a, b\}$	1	$x \in \{d, e\}$
1	$z \in \{d, e\} \setminus \{x\}$	2	$w \in \{a, b\} \setminus \{y\}$
2	$w \in \{a, b\} \setminus \{y\}$	1	$z \in \{d, e\} \setminus \{x\}$
Outcome:	c	Outcome:	c

Preference Profile 2

Player 1	Player 2
a	b
b	a
c	c
d	d
e	e

Subgame-perfect equilibrium paths:

Player	Action	Player	Action
1	b	2	a
2	$x \neq a, b$	1	$x \neq a, b$
1	$y \neq a, b, x$	2	$y \neq a, b, x$
2	$z \neq a$	1	$z \neq b$
Outcome:	a	Outcome:	b

Preference Profile 3

Player 1	Player 2
a	c
b	b
c	a
d	d
e	e

Subgame-perfect equilibrium paths:

Player	Action
1	$x \in \{c, d, e\}$
2	$y = a \vee (x \in \{d, e\} \wedge y \in \{d, e\} \setminus \{x\})$
1	$z = c \vee (x = c \wedge z \in \{d, e\})$
2	$(w \in \{d, e\}) \vee (y \in \{d, e\} \wedge w = a)$
Outcome:	b

Player	Action
2	$x \in \{a, d, e\}$
1	$y = c \vee (x \in \{d, e\} \wedge y \in \{d, e\} \setminus \{x\})$
2	$z = a \vee (x = a \wedge z \in \{d, e\})$
1	$(w \in \{d, e\}) \vee (y \in \{d, e\} \wedge w = c)$
Outcome:	b

Preference Profile 4

Player 1	Player 2
a	e
b	c
c	a
d	b
e	d

Subgame-perfect equilibrium paths:

Player	Action
1	$x \in \{c, e\}$
2	$y \neq x, a$
1	if $y \notin \{c, e\} \setminus \{x\}$ then $z \in \{c, e\} \setminus \{x\}$ otherwise, $z \in \{b, d\}$
2	$w \neq a$
Outcome:	a

Player	Action
2	$x \neq a$
1	$(x \in \{c, d, e\} \wedge y \in \{c, d, e\} \setminus \{x\})$ $\vee (x \in \{b, c\} \wedge y \in \{b, c\} \setminus \{x\})$
2	$z \neq x, y, a$
1	$w \neq x, y, z, a$
Outcome:	a

3.2 Voting by Alternating Offers and Vetoes

Preference Profile 1

Player 1	Player 2
<i>a</i>	<i>e</i>
<i>b</i>	<i>d</i>
<i>c</i>	<i>c</i>
<i>d</i>	<i>b</i>
<i>e</i>	<i>a</i>

Subgame-perfect equilibrium paths:

Player	Action
1	$x \in \{a, b, c\}$
2	yes if $x = c$ otherwise: no, $y \in \{c, d, e\}$
1	yes if $y = c$ otherwise: no, $z \in \{a, b, c\} \setminus \{x\}$
2	yes if $z = c$ otherwise: no, $w \in \{c, d, e\} \setminus \{y\}$
1	yes if $w = c$ otherwise: no, c
Outcome:	c

Player	Action
2	$x \in \{c, d, e\}$
1	yes if $x = c$ otherwise: no, $y \in \{a, b, c\}$
2	yes if $y = c$ otherwise: no, $z \in \{c, d, e\} \setminus \{x\}$
1	yes if $z = c$ otherwise: no, $w \in \{a, b, c\} \setminus \{y\}$
2	yes if $w = c$ otherwise: no, c
Outcome:	c

Preference Profile 2

Player 1	Player 2
<i>a</i>	<i>b</i>
<i>b</i>	<i>a</i>
<i>c</i>	<i>c</i>
<i>d</i>	<i>d</i>
<i>e</i>	<i>e</i>

A sequence of actions is a SPE iff:

1. Outcome is first mover's top ranked option
2. In the first move of the game, the player who starts does not offer any of the top ranked options
3. The player who moves second does not reject his top option when offered.

Preference Profile 3

Player 1	Player 2
<i>a</i>	<i>c</i>
<i>b</i>	<i>b</i>
<i>c</i>	<i>a</i>
<i>d</i>	<i>d</i>
<i>e</i>	<i>e</i>

The following are all the possible SPE plays when player 2 moves first:

	2	1	2	1	2
	<i>b</i>	yes			
	<i>c</i>	no, <i>b</i>	yes		
	<i>c</i>	no, <i>a</i>	no, <i>b</i>	yes	
	<i>c</i>	no, <i>a</i>	no, $z \in \{d, e\}$	no, <i>b</i>	yes
	<i>c</i>	no, <i>a</i>	no, $z \in \{d, e\}$	no, $w \in \{d, e\} \setminus \{z\}$	no, <i>b</i>
	<i>c</i>	$y \in \{d, e\}$	no, $z \in \{d, e\} \setminus \{y\}$	no, <i>b</i>	yes
	<i>c</i>	$y \in \{d, e\}$	no, $z \in \{d, e\} \setminus \{y\}$	no, <i>a</i>	no, <i>b</i>
$x \in \{d, e\}$	$y \in \{d, e\} \setminus \{x\}$		no, <i>b</i>	yes	
$x \in \{d, e\}$	$y \in \{d, e\} \setminus \{x\}$		no, <i>c</i>	no, <i>b</i>	yes
$x \in \{d, e\}$	$y \in \{d, e\} \setminus \{x\}$		no, <i>c</i>	no, <i>a</i>	no, <i>b</i>

Preference Profile 4

Player 1	Player 2
<i>a</i>	<i>e</i>
<i>b</i>	<i>c</i>
<i>c</i>	<i>a</i>
<i>d</i>	<i>b</i>
<i>e</i>	<i>d</i>

A sequence of actions is a SPE iff

1. It ends with *a* if 1 moves first and *c* if 2 moves first

2. There are at least 2 rounds of proposals

3. Must start with d

Player	Action
1	d
2	no, offer anything but b
1	accept if a , otherwise reject and offer a or b
2	accept if a , reject if b and offer anything from what remains
1	accept only if a , otherwise reject an offer a
Outcome:	a

Player	Action
2	d
1	no, offer anything but e
2	accept if c , otherwise reject and offer c or e
1	accept if c , reject if e and offer anything from what remains
2	accept only if c , otherwise reject an offer c
Outcome:	c

4 Sample of Instructions for the Experiment

This is an experiment in interactive decision-making. By participating in this experiment, you will win a show-up bonus of \$10 plus a prize that depends upon the choices that you and other participants make.

The experiment consists of 40 rounds. In each round the computer will randomly match you to another participant and both of you will play the game described below. The outcome of this game is a selection of a single option from a list of five, labeled a,b,c,d,e.

In each round, each of the five options will be assigned a dollar value. One option will be worth \$1.00, a second option will be worth \$0.75, a third option will be worth \$0.50, a fourth option will be worth \$0.25 and a fifth will be worth \$0.00. At the beginning of each round, you will be told what dollar value you assign to each of the options, as well as what dollar value the other player assigns to each of the options. The table below shows a possible configuration of values for you and the other player (the values in the experiment itself) :

	You	Other Player
\$1.00	d	c
\$0.75	b	a
\$0.50	a	e
\$0.25	e	b
\$0.00	c	d

Similarly, the participant you are matched with will also be shown the values that both he and you assign to each option. In other words, both you and the participant you are matched with will see the same table as the one shown above.

The 40 rounds will be divided into four stages consisting of 10 rounds each (such that stage 1 consists of rounds 1-10, stage 2 consists of rounds 11-20, stage 3 consists of rounds 21-30 and stage 4 consists of rounds 31-40). In each stage, half of the participants will be randomly chosen to belong to group A and the other half will belong to group B. The participants belonging to the same group will have the same assignment of money to options. In each of the 10 rounds of a stage, the participants of one group will be randomly matched to the participants in the other group. Thus, in each stage of 10 rounds, the values you assign to each option and the values of your matched participant will remain unchanged.

At the beginning of each stage you will be shown a message that announces the start of a new stage. This message will alert you to the fact that the values of the options for you and the other player may be different from what they were in the previous stage. As in every round, these values will be displayed on the screen.

Your total payoff in the entire experiment will equal the sum of payoffs across all 40 rounds plus a show-up bonus of \$10.

Your payoff in each round will be displayed on the top right of the screen.

We now describe the rules of the game that you will play in each of the 40 rounds. These rules determine which option is selected at the end of the round.

- In each round, one of the two participants who are matched to play the game, is randomly selected to be Player 1 (the other participant is then Player 2). This means that each of the two participants has an equal chance of being selected as Player 1. This also means that each participant may be in the role of

Player 1 on some rounds and in the role of Player 2 on other rounds.

- The game proceeds in two steps
 - Step 1: Player 1 moves first and selects a shortlist of three distinct options out of a,b,c,d,e.
 - Step 2: Player 2 is informed of Player 1's shortlist, and chooses the final option out of it.

To illustrate these rules, here is a simple example.

Suppose that in a particular round with payoffs as listed in the table above, you have been selected to be Player 1, while the other participant you are matched with had been selected to be Player 2. Suppose that the following actions have been chosen

- Player 1 (You) moves first and selects the shortlist a, c, d.
- Player 2 (the other participant you are matched with) moves second and chooses c out of a, c, d.

This round thus ends with c being selected. You thus receive a payoff of \$0 for this round, while the participant you are matched with receives a payoff of \$1.

Quiz:

To confirm whether you understood the rules of the game, please answer the following question. Assume that the values you assign to each option are as follows:

	You
\$1.00	c
\$0.75	e
\$0.50	d
\$0.25	b
\$0.00	a

Question 1. Suppose that in a particular round, players choose the following actions.

- Player 1 moves first and selects the shortlist a, c, e.
- Player 2 moves second and selects c out of the shortlist a, c, e.

(a) Which option will be selected?

- a
- b
- c
- d
- e

(b) What will your payoff be?

- \$1.00
- \$0.75
- \$0.50
- \$0.25
- \$0.00

Question 2. Suppose that in a particular round, the participant you are matched was selected to be Player 1, and selected the shortlist b, d, e.

(a) Suppose that you selected the option d out of the shortlist. What will your payoff be?

- \$1.00
- \$0.75
- \$0.50
- \$0.25
- \$0.00

(b) Suppose that you selected the option e out of the shortlist. What will your payoff be?

- \$1.00
- \$0.75
- \$0.50
- \$0.25
- \$0.00

Click to send your answers to the quiz

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5 Observed Outcomes

Profile	Procedure		a	b	c	d	e	ab	ac	bc	abc	other
Pf1	AS	early	.02	.11	.78	.08	.02					
		late	.00	.06	.91	.04	.00					
		pooled	.01	.08	.84	.06	.01					
	SL	early	.05	.06	.79	.07	.04					
		late	.03	.03	.87	.05	.03					
		pooled	.04	.04	.83	.06	.03					
	VAOV	early	.04	.05	.81	.06	.04					
		late	.00	.04	.92	.05	.00					
		pooled	.02	.04	.86	.05	.02					
	VR	early	.07	.09	.54	.08	.06	.02	.01	.02	.00	.10
		late	.03	.05	.87	.01	.01	.00	.01	.01	.01	.02
		pooled	.05	.07	.70	.05	.03	.01	.01	.02	.00	.06
Pf2	AS	early	.44	.36	.15	.04	.01					
		late	.42	.43	.14	.01	.00					
		pooled	.43	.39	.15	.02	.01					
	SL	early	.50	.48	.03	.00	.00					
		late	.46	.51	.01	.02	.00					
		pooled	.48	.50	.02	.01	.00					
	VAOV	early	.47	.48	.03	.02	.01					
		late	.56	.39	.03	.02	.00					
		pooled	.51	.44	.03	.02	.00					
	VR	early	.24	.47	.02	.01	.01	.20	.02	.00	.03	.01
		late	.19	.43	.05	.03	.00	.23	.02	.03	.02	.01
		pooled	.21	.45	.03	.02	.00	.21	.02	.01	.03	.01
Pf3	AS	early	.09	.79	.08	.04	.01					
		late	.05	.85	.06	.03	.01					
		pooled	.07	.82	.07	.03	.01					
	SL	early	.25	.31	.35	.10	.00					
		late	.41	.25	.23	.10	.02					
		pooled	.32	.28	.29	.10	.01					
	VAOV	early	.19	.71	.09	.01	.00					
		late	.06	.84	.07	.01	.02					
		pooled	.12	.77	.08	.01	.01					
	VR	early	.08	.38	.11	.06	.03	.10	.00	.11	.11	.01
		late	.16	.38	.11	.08	.04	.07	.00	.03	.11	.01
		pooled	.12	.38	.11	.07	.03	.08	.00	.07	.11	.01
Pf4	AS	early	.51	.09	.32	.03	.06					
		late	.51	.11	.33	.05	.01					
		pooled	.51	.10	.32	.04	.03					
	SL	early	.40	.04	.45	.06	.07					
		late	.48	.02	.46	.04	.00					
		pooled	.45	.03	.45	.05	.03					
	VAOV	early	.46	.09	.40	.03	.02					
		late	.47	.05	.29	.06	.13					
		pooled	.46	.07	.34	.05	.07					
	VR	early	.37	.08	.30	.07	.01	.01	.10	.04	.01	.02
		late	.41	.12	.18	.06	.02	.02	.12	.03	.01	.04
		pooled	.39	.10	.24	.06	.01	.01	.11	.03	.01	.03

6 Comparison in Terms of Efficiency and MST

The following table reads as follows. t_1 , t_2 , t_3 and t_4 represents the four different procedures: VR, AS, VAOV, and SL. $t_i - t_j$ represents the difference of percentage of outcomes that *violated* the criterion on that line. So, for instance, the coefficient of 0.087 for Eff - Pf2 in the column $t_2 - t_1$ means that we observed an additional 8.7% of inefficient outcomes is AS compared to VR for the preference profile Pf2. The p-values are probabilities testing whether that number is significantly different from zero (bilateral test). Tests of significance take into account correlation across rounds.

Eff - Pf2	t2-t1	t3-t1	t4-t1	t3-t2	t4-t2	t4-t3
<i>Coef.</i>	0.087	-0.036	-0.056	-0.123	-0.143	-0.020
<i>Std. Err.</i>	0.021	0.017	0.015	0.019	0.018	0.013
<i>t</i>	4.170	-2.150	-3.650	-6.450	-7.960	-1.600
<i>P> t </i>	0.000	0.033	0.000	0.000	0.000	0.112
Eff - Pf3	t2-t1	t3-t1	t4-t1	t3-t2	t4-t2	t4-t3
<i>Coef.</i>	-0.082	-0.098	-0.013	-0.016	0.069	0.085
<i>Std. Err.</i>	0.019	0.018	0.023	0.010	0.017	0.016
<i>t</i>	-4.320	-5.360	-0.570	-1.620	4.050	5.240
<i>P> t </i>	0.000	0.000	0.567	0.108	0.000	0.000
Eff - Pf4	t2-t1	t3-t1	t4-t1	t3-t2	t4-t2	t4-t3
<i>Coef.</i>	-0.052	-0.070	-0.119	-0.018	-0.067	-0.049
<i>Std. Err.</i>	0.024	0.024	0.023	0.019	0.018	0.019
<i>t</i>	-2.140	-2.870	-5.080	-0.940	-3.700	-2.640
<i>P> t </i>	0.034	0.005	0.000	0.347	0.000	0.009
MST - Pf1	t2-t1	t3-t1	t4-t1	t3-t2	t4-t2	t4-t3
<i>Coef.</i>	-0.109	-0.132	-0.091	-0.023	0.018	0.042
<i>Std. Err.</i>	0.033	0.033	0.034	0.023	0.025	0.025
<i>t</i>	-3.270	-4.010	-2.640	-1.010	0.730	1.700
<i>P> t </i>	0.001	0.000	0.009	0.312	0.466	0.092
MST - Pf2	t2-t1	t3-t1	t4-t1	t3-t2	t4-t2	t4-t3
<i>Coef.</i>	0.000	-0.008	-0.016	-0.008	-0.016	-0.008
<i>Std. Err.</i>	0.010	0.009	0.008	0.009	0.009	0.007
<i>t</i>	-0.010	-0.860	-1.890	-0.800	-1.760	-1.150
<i>P> t </i>	0.991	0.390	0.060	0.425	0.080	0.250
MST - Pf4	t2-t1	t3-t1	t4-t1	t3-t2	t4-t2	t4-t3
<i>Coef.</i>	-0.044	-0.026	-0.112	0.019	-0.068	-0.087
<i>Std. Err.</i>	0.023	0.027	0.023	0.023	0.018	0.023
<i>t</i>	-1.950	-0.950	-4.860	0.800	-3.720	-3.700
<i>P> t </i>	0.053	0.342	0.000	0.423	0.000	0.000

We did not include a line for Eff - Pf1, because each outcome is efficient in Pf1, since preferences are completely opposed. We did not include a line for MST - Pf3, because numbers are identical to Eff - Pf3. Finally, numbers for Eff+MST corresponds to numbers of MST for Pf1 and Pf4, and to numbers of *Eff* for Pf2 and Pf3.

7 Difference of Behavior in Early vs. Late Rounds

The following table gives for each dynamic procedure and each profile of preferences the percentage of matched pairs that behave in a way that is consistent with backward induction in the earlier rounds (1-10 for *Pf1* and *Pf4*, and 10-20 for *Pf2* and *Pf3*) vs. later rounds (20-30 for *Pf2* and *Pf3*, and 30-40 for *Pf1* and *Pf4*). The column on differences represent the percentage in later rounds minus the percentage in earlier rounds. Significance tests are bilateral tests for whether this difference is non-zero in a way that is statistically significant.

Procedure	Profile	SPE-early	SPE-late	Difference	St. Error	t	P > t
AS	Pf1	.77	.91	.14	.03	4.43	0
	Pf2	.25	.51	.26	.06	4.61	0
	Pf3	.77	.84	.07	.04	1.59	.12
	Pf4	.50	.49	-.01	.04	-0.25	.80
VAOV	Pf1	.81	.91	.10	.03	3.27	0
	Pf2	.76	.77	.01	.04	0.25	.80
	Pf3	.68	.78	.11	.04	2.71	.01
	Pf4	.27	.43	.16	.06	2.89	.01
SL	Pf1	.78	.87	.10	.04	2.50	.01
	Pf2	.65	.83	.18	.05	3.88	0
	Pf3	.43	.49	.06	.06	0.90	.37
	Pf4	.46	.84	.38	.04	8.76	0